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SOVIET CONFERENCE ON SAVING ELECTRIC POWER

A. A. Tayts, Engineer

At a scientific and technical session on problems of electric power economy in the machine-building and textile industries, held in Moscow in the fourth quarter of 1949 under the auspices of MONITOE (Moscow Branch of the All-Union Scientific and Technical Society of Power Engineers) and Mosenergosbyt (Moscow Administration for the Sale of Electric Power Equipment), 19 reports and communications were discussed and over 200 specialists took part in the work of the session, including over 100 delegates summoned from other towns.

Engineer V. N. Budennyy, Energosbyt, Mosenergo, in his report "Economy of Electric Power in the Industrial Enterprises of Moscow and Adjacent Districts," stresses the importance of introducing new methods of metal-working and electrothermal processes for saving electric power.

Engineer A. K. Shadrin, MONITOE, discussed the results of the 1948 All-Union Competition for the best suggestion for saving electrical and thermal energy.

Engineer A. A. Tayts, Energometallurgprom, in his report "Methods for Standardizing Specific Power Consumption," discussed problems connected with working out and introducing average progressive norms for specific power consumption, which must be created on the basis of an analysis of power balances and empirical power characteristics of equipment under the most advantageous distribution of load between the individual units, the method of relative increments.

M. M. Morozov, Cand Tech Sci, Condenser Plant, in his report "The Production and Operation of Static Condensers," showed that for each 1000 kw of new generator power it is necessary to introduce 200-250 kw of supplementary reactive power. He acquainted the delegates with a plan for installing 25-kvar static condensers (impregnated in oil) and 40-kvar units (impregnated with sovol).

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Engineer G. A. Drugov, Electric Meters Plant, MEP (Ministry of the Electrical Industry) read a report "State and Prospects of Electrical Measuring Instrument Production."

Docent A. S. Sandlea, Cand Tech Sci, MEI (Moscow Power Engineering Institute imeni Molotov), in his report "The Regulated Electric Drive of Heavy Duty Mechanisms With a Blower-Type Moment of Inertia," described a regulated induction drive designed in MEI with a rotatable stator which can be used for economical speed regulation of blower mechanisms without substantially complicating existing designs of induction motors. For many installations of considerably smaller power, the use of electromagnetic slip couplings is feasible.

M. G. Lozinskiy, Senior Scientific Collaborator, Institute of Metallurgy imeni Baykov, Academy of Sciences USSR, in his report "The Present State of the Technology of the Induction Heating of Metals and Related Problems of Electric Power Economy," pointed out that the expenditure of electric power on heating structural steel is 0.35-0.45 kwhr/kg for surface hardening, 0.4-0.45 kwhr/kg for copper brazing and 0.45-0.65 kwhr/kg for stamping and forging.

Engr A. S. Tikhomirov, Automobile Plant imeni Stalin, in his paper "Automatic Control of Metal-Cutting Machines," described the experience of the plant in automatic control of metal-cutting machines, especially in connection with the organization of production lines for processing special parts and units.

B. B. Lazarenko, Dr Tech Sci, Scientific Research Institute, Ministry of the Electrical Industry, read a report on "Electric Spark Working of Metals" in which he gave information on power-supply circuits for electric spark installations in the light of power economy requirements.

Engr Kh. R. Palyan Energosbyt, Armenenergo, in his paper "High Frequency Drying of Timber," drew attention to the importance of determining the permitted temperature limits and the limiting field gradient in order to increase the power concentration, and obtain a more precise determination of final moisture and optimum frequency.

Engr T. A. Titov, Automobile Plant imeni Stalin, read a report entitled "Economy of Electric Power by Introducing Modern Technology in Machine Building." He remarked that high-output shot blasters have been introduced in the manufacturing shops of the plant for cleaning castings, instead of sand chambers. Electric vibrators have replaced pneumatic ones, and flame furnaces have been fitted with injection blowpipes. Technological processes on casting furnaces have been automatized. Automatic lines have been introduced in the mechanical shops; metal cutting operations have been replaced by upsetting machines; the technology of preparing stampings have been changed. All this ensured a considerable saving of electric power expended per unit of production.

Engr A. A. Filatov, in his report "Experience in Electric Power Economy at the Kolomensk Steam Locomotive Building Plant imeni Kuybyshev," remarked that power economy measures were aimed at ensuring the efficient operation of compressor installations, cutting consumption of compressed air and oxygen, improving the operation of electric furnaces and minimizing idle periods for machine tools, cranes, etc. In the boiler shops of the plant, 50 per cent of all the welding work was changed from manual to automatic; dozens of production lines have been started in many shops. The speaker noted measures for changing over to high-speed machining of metals, from free forging to stamping, installing no-load circuit breakers, manufacturing and introducing devices for better loading of electric furnaces.

Docent A. D. Svenchanskiy, Cand Tech Sci, MEI, read a report entitled "Methods of Economizing Electric Power and the Rational Power of Resistance Furnaces for the Heat Treatment of Metals."

Docent B. S. Barskiy, Ministry of the Metallurgical Industry, read a report entitled "Electric Power Economy in Electric Arc Furnaces."

B. P. Kozlov, Cand Tech Sci, NIILTEKMASh (Scientific Research Institute of Light and Textile Machine Building), in his paper "Automatization in the Textile Industry," examined, in the Textile Industry Section, methods of automatizing preparatory, spinning, and weaving processes, and also control and automatic regulation of temperature and humidity in finishing factories.

S. A. Avayev, Cand Tech Sci, VEI (All-Union Thermal Engineering Institute), in his report "High Frequency Drying," gave principal circuit diagrams of tube generators, and also indicated the fields of application of dielectric heating in the textile industry.

Docent N. I. Konovalov, Cand Tech Sci, Ivanovo Power Engineering Institute, in his report "Progressive Norming of Electric Power Expenditures in the Textile Industry," indicated the necessity for differentiating between separated items in the power balance figures of the over-all norm set for each enterprise. Differentiated power balances and more accurate electric power consumption norms were successfully introduced at many textile enterprises.

Engr G. L. Slobodkin, in his report "Experience in Electric Power Economy at the 'Trekhgornaya manufaktura imeni Dzerzhinskogo' Combine," described the electrical engineering and technological measures adopted at the plant to save electric power.

Engr P. A. Polonik, in his paper "Experience in Electric Power Economy at the 'Pobeda Oktyabrya' Factory," said that the drives on all ring-spinning frames had been changed from belts to "texropes"; weaving machines had been changed to texrope drive with countderdrive and connecting coupling, which enabled the power of the motor to be reduced from 1.5 kw to 0.8 kw. Magnetic starters had been fitted to warp machines and weaving machines with no-load speed limiting devices. Fluorescent lighting was introduced at the plant in 1949.

The session passed a resolution stressing the necessity for increasing control over the introduction of prize-winning suggestions and rapid publication and distribution of collections of such suggestions. Note was also made of the necessity of extending production facilities for the manufacture of improved types of static condensers, electric meters, recording devices, Dietz tongs /clamp-type current transformers?/, magnetic starters, and no-load limiters; and of the necessity for creating specific norms for electric power consumption on a practical basis by analyzing the power characteristics and the balance, taking into account modern technology, creating optimum working conditions, and optimum utilization of equipment.

The session made the following further recommendations:

Mechanical Working of Metals

New methods of working metals must be introduced -- electric spark methods, high-speed cutting, replacing cutting processes by cold forging, using cold hydraulic riveting, and automatization of technological processes by introducing automatic production lines.

Electric Arc Furnaces

It is necessary to determine the optimum electrical parameters of installations, taking into account the latest investigations in this field, to introduce wide-scale reconstruction of old-design electromagnetic regulators, to make extensive use of the acid electrosmelting process and the remelt method of operations, and to extend the use of duplex electrosmelting processes.

Thermal Resistance Furnaces

It is necessary to organize and increase the production of high-efficiency heat insulation materials (ultralight-weight foam diatomite parts, slag wool, vermiculite parts). It is possible to obtain a great saving of electric power by accelerating the heating process, decreasing idle time, introducing continuous operation, and ensuring full loading.

Induction Heating

The wide introduction of surface local hardening of the working portions of steel parts by high-frequency currents is recommended. It is necessary to organize sections for high-frequency soldering with hard solders.

Drying Nonmetallic Materials by High-Frequency Heating

Work on investigating the feasibility of using high-frequency heating to dry various nonmetallic materials should be increased. In particular, it is advisable to set up an experimental plant for drying wool by this method. The need for publishing literature on problems of high-frequency drying of nonmetallic materials was brought to the attention of Gosenergoizdat.

Automatization of Processes in the Textile Industry

The attention of NITO (Scientific and Technical Society) divisions at enterprises was drawn to the need for assisting in rapid mastery of instruments and mechanisms for automatization. The necessity for designing a spinning regulator to operate with commutator motor drives for ring-spinning machines was noted.

Introduction of Daylight Lamps

It was noted that the Ivanovo Institute for the Protection of Labor should work out, as soon as possible, a daylight-type standard lighting installation for textile enterprises.

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